

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Applicant : Leary et al.  
App. No : 10/664,699  
Filed : September 18, 2003  
For : AIRCRAFT WATER HEATING SYSTEM  
Examiner : Mark H. Paschall  
Art Unit : 3742  
Conf No. : 4708

**REPLY BRIEF**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Dear Sir:

Appellant submits the following remarks in response to the Examiner's Answer.

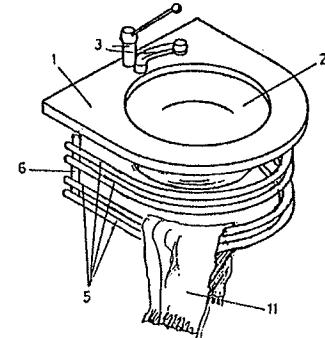
As an initial matter, Appellant would like to draw attention to the Examiner's statement at page 4 of the Examiner's Answer that "[b]asically, the elements claimed in claim 1 define an instantaneous heater for water with an electric heater extending along the length of the tube carrying the water, with a substantial length of the tube having a volume of about 14 ounces of water." In addition, Appellant would like to draw attention to the Examiner's statement at page 8 of the Examiner's Answer:

In conclusion, the EP reference teaches instantaneous heating for water with coiled tubes for the water, the Leuschner patent teaches heating small volumes of water with coiled tubes and heater that follow the curvature of the tubes, in proximity to for heating, as set forth in the instant claims, with the tubes of the water having capacity to heat small volumes of water as broadly claimed.

These statements underscore that the Examiner in this application simply dismisses the need to identify each of the limitations and to provide a reasonable explanation of why a person having ordinary skill in the art would have made the asserted combination.

EP '453 (Christopher) Does Not Teach A Coiled Instantaneous Heater

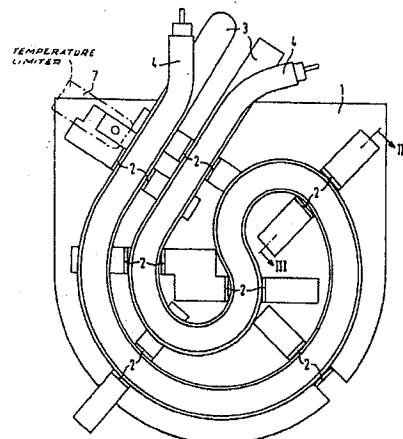
The Examiner states in the first two lines of page 5 of the Answer that “[t]he heater of Ep 453’ teaches a coiled tube heater for an instantaneous heater.” Applicant submits that the first portion of this statement (“teaches a coiled tube heater”) is directly contrary to the Examiner’s statement at page 3 of the Examiner’s Answer that “Ep … does not teach the heater along the heating tube [nor] coil around it.” Moreover, the second portion of the statement (i.e., instantaneous heater) also is incorrect in that EP ‘453 (Christophers) did not disclose or teach an instantaneous heater.



EP ‘453 (Christophers) taught a washstand that contained a wash basin 2 and a radiator surrounding the wash basin. The radiator supplied heat to the surrounding room. The radiator comprised a plurality of parallel pipes (i.e., no coil) that connected to a water inlet and a water outlet. The water inlet and the water outlet formed a part of a central heating or domestic water pipe, as set forth in Claim 1 of Christophers (English translation). Contrary to the Examiner’s assertion, there was absolutely no teaching of a coiled tube heater or an instantaneous heater.

Leuschner Did Not Teach Coils

At the bottom of page 5, the Examiner argues that “figure 1 of Leuschner clearly teaches a heating unit having two coils in close proximity to each other.” Figure 1 is shown to the right. Appellant submits that, at best, only one coil is shown to the extent that any coil is shown at all.



Thus, neither EP ‘453 (discussed above) nor Leuschner teaches “a tube comprising a plurality of coils with each coil engaging or being close to an adjacent coil” (Claim 1) or a “water tube comprising a spiral configuration to define a series of water tube coils” (Claim 19). Further, as admitted by the Examiner at page 7, “[t]he patent to GB 815 … is not relied on for teaching the heater/tube orientation as coiled.” Thus, none of the applied references teach these limitations and the combination necessary cannot teach limitations not taught by any of the combined references.

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For at least this reason alone, the rejections of Claims 1, 2, 4, 6-13, 17 and 19-25 should be reversed and the Examiner should be directed to allow these claims.

*The Suggested Modification Renders EP '453 Unsatisfactory for its Intended Purpose*

The Examiner then suggests modifying a radiator of EP '453 by replacing the heating element contained within one of the parallel tubes of EP'453 (see Claim 6 of EP '453) with a heating element for Leuschner that extends along the longitudinal extent of a fluid tube. The Examiner explains that such a modification would result in effective heating of the fluid. See page 4. If, however, one were to make such a substitution, the radiator of EP' 453 would be rendered unsatisfactory for its intended purpose as a space heating radiator. *In re Gordon*, 733 F.2d 900 (Fed. Cir. 1984). In short, the internal heater of EP '453 is buffered by the water flowing through the tubes. The buffering of the heat generated by the internal heater reduces the likelihood of burns that could be caused by direct access to the heating elements. Replacing the internal heater of EP '453 would require a higher energy output (i.e., higher energy needed to heat the water through the pipe wall) and would expose people in the room being heated by the radiator to burns through direct contact with the external heater. Thus, such a modification would not have been obvious.

*The Claims Define "Substantial Length"*

In addition, the Examiner has argued at page 4 that "Applicant's claims do not define the term 'substantial length'..." Applicant submits that Claim 1 states "said substantial length of said tube defining a volume of less than that required to contain approximately 14 ounces of water..." Accordingly, "substantial length" has been defined explicitly in the claims.

Further, the Examiner has argued at page 4 that heating a length of tubing that defines a volume of less than that required to contain approximately 14 ounces of water is a matter of design choice. The Examiner has argued that because the claim language does not specify the flow rate and flow pressure, the limitation is not critical. Such an argument, however, reflects a failure to appreciate that the flow rate and flow pressure do not matter to the application. In use, the water will be intermittently used. During the time in which water flow is not demanded, water is heated within the length of tubing. When a user operates a faucet on an aircraft, a limited duration of flow is experienced and the limited duration of flow allows the heated water

to be replaced by unheated water. The unheated water then is heated while waiting for the next user of the lavatory. Thus, flow rate and flow pressure are not critical to the claimed invention.

Claim 4

With respect to Claim 4, the heater is not “between adjacent sections of the tube” in either Leuschner (shown directly above) or EP ‘453 (shown a page earlier). Thus, the Examiner has failed to identify any prior art disclosing or teaching a tube with a circular exterior cross-section such that the sections create a recess between the sections, and the heater being positioned in the recess. For at least this reason alone, the rejection of Claim 4 should be reversed and the Examiner should be directed to allow Claim 4.

Claim 6 and Claim 7

With respect to Claim 6, the claim recites “the heater coils are on the outside of the tube coils.” In short, the coiled tube can be considered to define a cylinder. Claim 6 recites that the heater coils are on the outside of the tube coils and, therefore, the heater coils are outside of the cylinder. Similarly, Claim 7 recites that the heater coils are on the inside of the tube coils. Thus, in the claimed configuration of Claim 7, the heater coils are on the inside of the cylinder. Because none of the applied references disclosed a coiled tube, none of the references disclosed a heater coil on the outside or on the inside of the heater coil. For at least these reasons, the rejection of Claims 6 and 7 should be reversed and the Examiner should be directed to allow Claims 6 and 7.

Claim 8

With respect to Claim 8, none of the applied references discloses or teaches a coiled structure and none of the applied references discloses a construction in which the tube and the heater defined a tubular bundle of coils. For at least this reason, the rejection of Claim 8 should be reversed and the Examiner should be directed to allow Claim 8.

Claim 9

With respect to Claim 9, which the parallel pipes of EP ‘453 extend around the periphery of the wash basin, EP ‘453 does not disclose or teach a coiled tube nor a coiled heater. In fact, none of the applied references teach a coiled tube and a coiled heater that are each formed with a plurality of coils. Moreover, none of the applied references teach such a plurality of coils that are sufficiently large to extend around the exterior of a lower portion of a wash basin. For at least

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these reasons, the rejection of Claim 98 should be reversed and the Examiner should be directed to allow Claim 9.

Claims 12 and 13

Appellant notes that the Examiner has failed to set forth any rationale for the rejection of Claims 12 and 13.

Claims 14-18 and 19-25

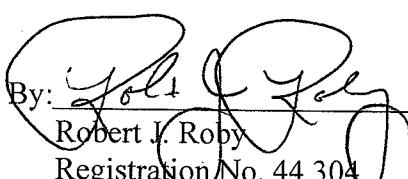
Moreover, Appellant notes that while method Claims 14-18 and apparatus Claims 19-25 recite numerous limitations not carried over from Claims 1, 2, 4, and 6-13, the Examiner has simply stated that these claims "are unpatentable for the reasons set forth" in the discussion of Claims 1, 2, 4 and 6-13. Thus, the Examiner has failed to explain any support for the rejections of Claims 14-18 and 19-25, which recite, for example, "a water tube comprising a spiral configuration to define a series of water tube coils" (Claim 19), "an electric heater comprising a spiral configuration to define a series of electric heater coils" (Claim 19), "the electric heater coils and the water tube coils having a common axis of curvature" (Claims 19), "each of the series of electric heater coils being in intimate relationship with only two adjacent coils of the water tube coils" (Claim 19) and "a temperature responsive switch positioned within the water tube coils" (Claim 25). While Applicant has set forth but a few examples, Claims 14-18 and Claims 19-25 each are believed to define over the applied references.

Please charge any additional fees, including any fees for additional extension of time, or credit overpayment to Deposit Account No. 11-1410.

Respectfully submitted,

KNOBBE, MARTENS, OLSON & BEAR, LLP

Dated: March 25, 2009

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